

HP OpenView

Storage Mirroring application notes

High availability for Lotus Domino

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Storage Mirroring High availability for Lotus Domino application notes

Introduction

Lotus Domino is an integrated e-mail, calendaring, group scheduling, contact and task management, Web browsing, and knowledge management tool. It is an integrated messaging and Web application software platform. Together these products deliver secure, interactive Web applications and a solid infrastructure for messaging and collaboration.

Storage Mirroring provides real-time enterprise data protection and replication. Storage Mirroring can be used to provide high availability for your Lotus Domino servers.

This document describes the steps necessary to configure Storage Mirroring to provide high availability for Windows servers running Lotus Domino server. These procedures allow a secondary server to assume the identity and role of the failed primary Domino server while maintaining the availability of the Domino services with minimal disruption or data loss.

To complete these instructions, you will install Lotus Domino and Storage Mirroring. You will also configure Storage Mirroring for replication and failover. Due to the complexities of these applications, this document is intended for network administrators with experience installing, configuring, and maintaining network applications including Storage Mirroring and Lotus Domino.

Requirements

- Two servers that meet one of the following operating system requirements:
 - Microsoft Windows NT 4.0 with Service Pack 4 or higher
 - Microsoft Windows 200x



NOTE: The two servers should both be running the same operating system. Although cross-platform mirroring and replication are available, HP recommends that the two servers be the same platform for effective failover and fallback.

- It is recommended that both source and target servers be member servers. (You may experience problems with promotion and demotion during failover if either of the machines are Primary or Backup Domain Controllers.)
- Both servers must be connected to the same physical network
- Two licensed copies of Lotus Domino
- Two licensed copies of Storage Mirroring

Install software on the source

1. Install Domino on the source, if it is not already installed.
2. Install Storage Mirroring on the source machine using the installation defaults.

Install and configure software on the target

1. Install Domino on the target using the same options used when installing Domino on the source machine.
2. Install Storage Mirroring on the target using the installation defaults.
3. Configure the Storage Mirroring service to interact with the desktop. Use the instructions under step a if you are using Windows 200x or under step b if you are using Windows NT.
 - For Windows 200x, follow these steps:
 - In **Control Panel, Administrative Tools, Services**, double-click the Storage Mirroring service.
 - Click the **Log On** tab.
 - Mark the check box **Allow service to interact with desktop** and click **OK**.
 - For Windows NT, follow these steps:
 - In **Control Panel, Services**, double-click the Storage Mirroring service.
 - Mark the check box **Allow service to interact with desktop** and click **OK**.

Configure and begin mirroring and replication

If you are replicating to the same target directory, for example, c :\Domino to c :\Domino, continue with the instructions below. If you are replicating to a different target directory, for example, c :\Domino to d :\Domino, skip to the instructions “[Replicating to a different target directory](#)” on page 5.

Replicating to the same target directory

This section assumes that your source and target machines have the same drive and directory structure. For example, you may be replicating c :\Domino to c :\Domino. If you need to replicate to a different directory on the target, for example, if c :\Domino on the source is replicated to d :\Domino on the target, see “[Replicating to a different target directory](#)” on page 5.

1. Select **Start, Programs, Storage Mirroring, Management Console**.
2. Double-click your source machine to log on.
3. Right-click the source and select **Properties**.
4. On the Source tab, enable **Block Checksum All Files on a Difference Mirror** and click **OK**.
5. Right-click your source machine and select **New, Replication Set** and enter the desired name for the replication set.
6. Select the Domino data that you wish to protect. The default installation for a single Domino server places the application and data files in the same directory, \Domino. Mark the \Domino directory to select it and all of its subdirectories.
7. By default, two configuration files, `Domino.ini` and `lotus.ini`, are placed in the \winnt directory. Locate and mark the .ini files for replication.
8. Locate and exclude any .dll and .exe files. Since the application files are already available on the target, they do not need to be replicated.
9. Right-click the replication set name and select **Save** to save the replication set.
10. Drag and drop the replication set onto the target. The Connection Manager dialog box opens.

- 11.** The **Source Server**, **Target Server**, **Replication Set**, and **Route** fields will automatically be populated. If you have multiple IP addresses on your target, verify the **Route** field is set to the correct network path. (For detailed information on connecting a source and target, see the Storage Mirroring user's guide.)
- 12.** Select **One to One** to map the replication set data from the source to an identical volume/directory structure on the target.
- 13.** Click **Connect** to start the mirror and replication processes.



NOTE: If you start Domino and mount the replicated databases on the target, or if the data on the target is otherwise modified, the data on the source and target will no longer match. If the updated data on the target is not needed, perform a full or difference with block checksum mirror from the source to the target. If the updated data on the target is needed, restore the data from the target to the source.

Mirroring and replication have now been established. Continue with "[Configuring failover when replicating to the same target directory](#)" on page 6 to complete your setup steps.

Replicating to a different target directory

This section assumes that your source and target machines have different drive and directory structures. For example, you may be replicating c:\Domino to d:\Domino. If you need to replicate to the same directory on the target, for example, if c:\Domino on the source is replicated to c:\Domino on the target, see "[Replicating to the same target directory](#)" on page 4.

- 1.** Select **Start, Programs, Storage Mirroring, Management Console**.
- 2.** Double-click your source machine to log on.
- 3.** Right-click the source and select **Properties**.
- 4.** On the Source tab, enable **Block Checksum All Files on a Difference Mirror** and click **OK**.
- 5.** Right-click your source machine and select **New, Replication Set** and enter the desired name for the replication set.
- 6.** Select the Domino data that you wish to protect. The default installation for a single Domino server places the application and data files in the same directory, \Domino. Mark the \Domino directory to select it and all of its subdirectories.
- 7.** By default, two configuration files, Domino.ini and lotus.ini, are placed in the \winnt directory. You will want to replicate these files to your target for disaster recovery in the event of a total machine failure. But since you are replicating to a different directory structure, if you experience a high availability interruption, such as a NIC failure, you will not want to use the replicated .ini files on the target because they may point to incorrect or non-existent data. You will be replicating your .ini files, but later in this document, you will be configuring failover to automatically use the specific .ini files that you need. Locate and mark the .ini files for replication.
- 8.** Locate and exclude any .dll and .exe files. Since the application files are already available on the target, they do not need to be replicated.
- 9.** Right-click the replication set name and select **Save** to save the replication set.
- 10.** Drag and drop the replication set onto the target. The Connection Manager dialog box opens.
- 11.** The **Source Server**, **Target Server**, **Replication Set**, and **Route** fields will automatically be populated. If you have multiple IP addresses on your target, verify the **Route** field is set to the correct network path. (For detailed information on connecting a source and target, see the Storage Mirroring user's guide.)

12. By default, the **All To One** mapping will be selected. Click the **Target Path** field and make the necessary changes to direct the files to the desired location on your target machine.

13. Click **Connect** to start the mirror and replication processes.



NOTE: If you start Domino and mount the replicated databases on the target, or if the data on the target is otherwise modified, the data on the source and target will no longer match. If the updated data on the target is not needed, perform a full or difference with block checksum mirror from the source to the target. If the updated data on the target is needed, restore the data from the target to the source.

Mirroring and replication have now been established. Continue with "[Configuring failover when replicating to a different target directory](#)" on page 7 to complete your setup steps.

Configure failover and begin failure monitoring

If you are replicating to the same target directory, for example, c:\Domino to c:\Domino, continue with the instructions below. If you are replicating to a different target directory, for example, c:\Domino to d:\Domino, skip to the instructions "[Configuring failover when replicating to a different target directory](#)" on page 7.

Configuring failover when replicating to the same target directory

This section assumes that your source and target machines have the same drive and directory structure. For example, you may be replicating c:\Domino to c:\Domino. If you are replicating to a different directory on the target, for example, if c:\Domino on the source is replicated to d:\Domino on the target, see "[Configuring failover when replicating to a different target directory](#)" on page 7.

1. If a failure occurs, you will want to have Domino start on the target machine automatically. To do this, create a batch file called postover.bat using the sample batch file below. Save the batch file to the same directory where your Storage Mirroring files are installed. Note that you will have to select the appropriate line to run depending on how you are running Domino.

POSTOVER.BAT

```
rem This file starts the Domino service on the target. If you are starting Domino as an application, comment out  
rem the first command of this file and uncomment the last command in this file.  
  
net start "Lotus Domino Server"  
  
rem c:\Domino\nserver.exe
```

2. After a failure is resolved, you will be ready to bring your source back online. At this time, you will want to stop Domino on the target automatically. To do this, create a batch file called preback.bat using the sample batch file below. Save the batch file to the same directory where your Storage Mirroring files are installed. Note that you will have to select the appropriate line to run depending on how you are running Domino.

PREBACK.BAT

```
rem This file stops the Domino service on the target. If you are running Domino as an application, comment out  
rem the first command of this file and uncomment the last command in this file.  
  
net stop "Lotus Domino Server"  
  
rem c:\Domino\nserver.exe -q
```

3. Select **Start, Programs, Storage Mirroring, Failover Control Center.**
4. Select the target machine from the list of available machines. If the target you need is not displayed, click **Add Target**, enter the machine name, and click **OK**.
5. To add a monitor for the selected target, click **Add Monitor**. Type the name of the source machine and click **OK**. The Monitor Settings window will open.
6. In the Monitor Settings window, mark the IP address that is going to failover.
7. Click **Scripts** and specify the location and file names of the scripts that were created earlier.
8. Click **OK** to go back to the Monitor Settings dialog box.
9. Click **OK** to begin monitoring the source machine.

In the event of a source machine failure, your target machine is now ready to stand in for your source. For detailed information on monitoring failover, see the *HP OpenView Storage Mirroring user's guide*.

Configuring failover when replicating to a different target directory

This section assumes that your source and target machines have different drive and directory structures. For example, you may be replicating c:\Domino to d:\Domino. If you are replicating to the same directory on the target, for example, if c:\Domino on the source is replicated to c:\Domino on the target, see "[Configuring failover when replicating to the same target directory](#)" on page 6.

1. Create the following directories on the target machine:

```
<drive>:\failfile\source  
<drive>:\failfile\target
```

2. Copy the configuration files (Domino.ini and lotus.ini) from the source machine to both of the directories you just created.
3. Using a text editor, edit the configuration files located in the <drive>:\failfile\target directory. Search and replace the source path with the target path that will be used after failover. For example, c:\Domino\data becomes d:\Domino\data and c:\Domino\data\w32 becomes d:\Domino\data\w32.
4. If a failure occurs, you will want to replace the source's .ini files with the edited files in <drive>:\failfile\target\, and then have Domino start on the target machine automatically. To do this, create a batch file called postodif.bat using the sample batch file below. Save the batch file to the same directory where your Storage Mirroring files are installed. Note that you will have to select the appropriate line to run depending on how you are running Domino.

POSTODIF.BAT

```
rem The first part of this file copies the source's .ini files into the target's system directory. The second  
rem part of this file starts Domino on the target.  
  
copy d:\failfile\target\Domino.ini c:\winnt\Domino.ini  
copy d:\failfile\target\lotus.ini c:\winnt\lotus.ini  
  
rem If you are starting Domino as an application, comment out the next command and uncomment the last command.  
net start "Lotus Domino Server"  
  
rem c:\Domino\nserver.exe
```

5. After a failure is resolved, you will be ready to bring your source back online. At this time, you will want to stop Domino on the target automatically and then restore the target's original .ini files to the target's system directory. To do this, create a batch file called prebdif.bat using the sample batch file below. Save the batch file to the same directory where your Storage Mirroring files are installed. Note that you will have to select the appropriate line to run depending on how you are running Domino.

PREBDIF.BAT

```
rem The first part of this file stops Domino on the target. The second part of the file copies the target's original  
rem .ini files into the target's system directory.  
  
rem If you are running Domino as an application, comment out the next command and uncomment the nserver line  
rem below.  
  
net stop "Lotus Domino Server"  
  
rem c:\Domino\nserver.exe -q  
  
copy d:\failfile\target\Domino.ini c:\winnt\Domino.ini  
copy d:\failfile\target\lotus.ini c:\winnt\lotus.ini
```

6. Select **Start, Programs, Storage Mirroring, Failover Control Center.**
7. Select the target machine from the list of available machines. If the target you need is not displayed, click **Add Target**, enter the machine name, and click **OK**.
8. To add a monitor for the selected target, click **Add Monitor**. Type the name of the source machine and click **OK**. The Monitor Settings window will open.
9. In the Monitor Settings window, mark the IP address that is going to failover.
10. Click **Scripts** and specify the location and file names of the scripts that were created above.
11. Click **OK** to go back to the Monitor Settings dialog box.
12. Click **OK** to begin monitoring the source machine.

In the event of a source machine failure, your target machine is now ready to stand in for your source. For detailed information on monitoring failover, see the *HP OpenView Storage Mirroring user's guide*.

Restoring your Domino data

If your source experiences a failure, such as a power, network, or disk failure, your target machine will stand in for the source(s) while you resolve the source machine issues. During the source machine downtime, data is updated on the target machine. When your source machine is ready to come back online, the data is no longer current and must be updated with the new data on the target machine.



NOTE: If the source server is rebooted while connected to the network before failback is performed, you may receive errors due to duplicate IP addresses.

-
1. Verify that your source machine is not connected to the network. If it is, disconnect it.
 2. Resolve the source machine problem that caused the failure.



NOTE: If you must rebuild your hard drive, continue with step 3. If you do not need to rebuild your hard drive, continue with step 6.

-
3. Install Windows. Since your source machine is not connected to the network, go ahead and use the source's original name and IP address.
 4. Install Storage Mirroring using the installation defaults.
 5. Install Domino using the same settings as the original installation.
 6. Verify that Domino is not running on the source. Depending on the type of failure or the options you selected during the installation, Domino could be running.
 7. On the target machine, select **Start, Programs, Storage Mirroring, Failover Control Center.**

8. Select the target machine that is currently standing in for the failed source.

9. Select the failed source and click **Failback**.

The pre-failback script entered during the failover configuration stops Domino on the target so that no additional changes can be made to the data during failback.

10. You will be prompted to determine if you want to continue monitoring the source server. Do not choose **Continue** or **Stop** at this time.

11. Reconnect the source machine to the network.

12. After the source is back online, select whether or not you want to continue monitoring this source machine (**Continue** or **Stop**).



NOTE: Verify that the Storage Mirroring connection on the source has been disconnected (right-click the connection in the Storage Mirroring Management Console and select **Disconnect**).

13. To begin the restoration process, open the Storage Mirroring Management Console and select **Tools**, **Restoration Manager**.



NOTE: You can also run the Storage Mirroring DTCL automated restoration script, which can be found in the *HP OpenView Storage Mirroring user's guide*, to complete the remaining steps in this section.

14. Complete the appropriate fields as described below.

- **Original Source**—The name of the source machine where the data originally resided.
- **Restore From**—The name of the target machine that contains the replicated data.
- **Replication Set**—The name of the replication set to be restored.
- **Restore To**—The name of the machine where the data will be restored. This may or may not be the same as the original source machine.

15. Identify the correct drive mappings for the data and any other restoration options necessary.



NOTE: For detailed information on the restoration options, see the *HP OpenView Storage Mirroring user's guide*.

16. Verify that the selections you have made are correct and click **Restore**.



NOTE: The restoration procedure time will vary depending on the amount of data that you have to restore.

You can monitor the progress of the restoration by viewing the connection from the target to the source in the Management Console.

17. After the restoration is complete, start Domino on the source machine.

18. Reestablish the Storage Mirroring Domino replication set connection.

At this time, your data is restored back to your source machine, the source machine is again the primary Domino server, and, if you selected to continue failover monitoring, the target is available to stand in for the source in the event of a failure.